All India Test Series (2023-24)

Test Code: ANY/07 | **AITS TEST - 07** | **YAKEEN NEET**

DURATION: 200 Minutes | **DATE: 14/04/2024** | **M. MARKS: 720**

ANSWER KEY

(PHYSICS)

SECTION-A

1.	(2)	8.	(1)	15.	(3)	22.	(3)	29.	(4)
2.	(3)	9.	(4)	16.	(4)	23.	(4)	30.	(4)
3.	(3)	10.	(3)	17.	(2)	24.	(2)	31.	(1)
4.	(1)	11.	(4)	18.	(3)	25.	(1)	32.	(3)
5.	(2)	12.	(2)	19.	(3)	26.	(2)	33.	(4)
6.	(1)	13.	(4)	20.	(3)	27.	(1)	34.	(1)
7.	(3)	14.	(3)	21.	(1)	28.	(1)	35.	(4)

SECTION-B

36.	(2)	39.	(4)	42.	(1)	45.	(3)	48.	(3)
37.	(1)	40.	(2)	43.	(3)	46.	(3)	49.	(1)
38.	(4)	41.	(3)	44.	(2)	47.	(1)	50.	(1)

(CHEMISTRY)

SECTION-A

51.	(2)	58.	(2)	65.	(2)	72.	(3)	79.	(3)
52.	(4)	59.	(1)	66.	(3)	73.	(3)	80.	(3)
53.	(1)	60.	(2)	67.	(4)	74.	(1)	81.	(4)
54.	(1)	61.	(4)	68.	(4)	75.	(4)	82.	(2)
55.	(2)	62.	(1)	69.	(2)	76.	(4)	83.	(1)
56.	(3)	63.	(1)	70.	(3)	77.	(1)	84.	(1)
57.	(2)	64.	(2)	71.	(1)	78.	(3)	85.	(1)

SECTION-B

86.	(4)	89.	(3)	92.	(1)	95.	(4)	98.	(2)
87.	(4)	90.	(1)	93.	(4)	96.	(3)	99.	(1)
88.	(4)	91.	(2)	94.	(1)	97.	(3)	100.	(4)

(BOTANY)

SECTION-A

101.	(2)	108.	(2)	115.	(3)	122.	(3)	129.	(2)
102.	(2)	109.	(3)	116.	(3)	123.	(3)	130.	(2)
103.	(4)	110.	(1)	117.	(3)	124.	(1)	131.	(3)
104.	(1)	111.	(4)	118.	(2)	125.	(3)	132.	(1)
105.	(3)	112.	(3)	119.	(4)	126.	(1)	133.	(4)
106.	(1)	113.	(1)	120.	(3)	127.	(1)	134.	(4)
107.	(4)	114.	(1)	121.	(3)	128.	(3)	135.	(1)

SECTION-B

136.	(3)	139.	(4)	142.	(3)	145.	(3)	148.	(3)
137.	(2)	140.	(2)	143.	(3)	146.	(4)	149.	(3)
138.	(4)	141.	(3)	144.	(2)	147.	(3)	150.	(2)

(ZOOLOGY)

SECTION-A

151.	(1)	158.	(3)	165.	(2)	172.	(3)	179.	(2)
152.	(2)	159.	(3)	166.	(1)	173.	(1)	180.	(2)
153.	(4)	160.	(4)	167.	(1)	174.	(4)	181.	(4)
154.	(1)	161.	(4)	168.	(1)	175.	(2)	182.	(1)
155.	(2)	162.	(2)	169.	(4)	176.	(1)	183.	(2)
156.	(4)	163.	(2)	170.	(2)	177.	(4)	184.	(1)
157.	(2)	164.	(4)	171.	(3)	178.	(2)	185.	(2)

SECTION-B

186.	(3)	189.	(1)	192.	(3)	195.	(3)	198.	(1)
187.	(4)	190.	(2)	193.	(4)	196.	(2)	199.	(4)
188.	(3)	191.	(3)	194.	(2)	197.	(3)	200.	(3)

Hints & Solutions

[AITS-07 | Yakeen-NEET | 14-04-2024]

(PHYSICS)

SECTION-A

1. (2)

Pressure gradient = $\left[\frac{P}{L}\right]$

$\left[\frac{F}{A\times L}\right]=\left[\frac{MLT^{-2}}{L^2L}\right]$

$=\left[ML^{-2}T^{-2}\right]$

(NEW NCERT 11th Page No. 7, 8)

2. (3)

$v=\sqrt{y}$

$\frac{dy}{dt}=\sqrt{y}$

$\int_0^y\frac{dy}{\sqrt{y}}=\int_0^t dt$

$2\sqrt{y}=t$

$y=\frac{t^2}{4}$

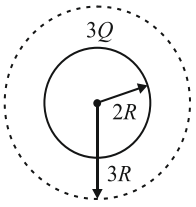
(NEW NCERT 11th Page No. 14, 15)

3. (3)

$\frac{(E_K)_1}{(E_K)_2}=\frac{h\nu_1-\phi_0}{h\nu_2-\phi_0}=\frac{1-0.5}{2.5-0.5}=\frac{0.5}{2}=\frac{1}{4}$

(NEW NCERT 12th Page No. 281, 282)

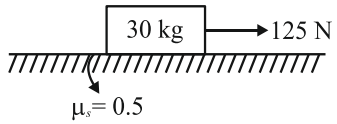
4. (1)



$\phi=\frac{q_{in}}{\varepsilon_0}=\frac{3Q}{\varepsilon_0}$

(NEW NCERT 12th Page No. 29, 30)

5. (2)



$F_{\text{limiting}} = 0.5 \times 30 \times 10 = 150$ N

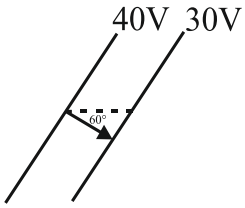
As 150 N > 125 N, So the block will not move and force of friction will be 125 N

$\therefore$ acceleration, $a=\frac{125-f}{30}=\frac{125-125}{30}=0\ \text{m/s}^2$

(NEW NCERT 11th Page No. 60, 61)

6. (1)

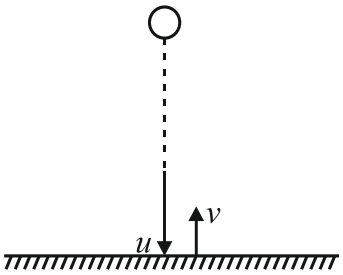
$E=-\frac{dV}{dr}$



$|\vec{E}|=\frac{10}{10\sin 30°\times 10^{-2}}=200\frac{\text{V}}{\text{m}}$ at 60° Clockwise with positive *x*-axis.

(NEW NCERT 12th Page No. 54, 55)

7. (3)



$v = -ue$

Momentum of ball after collision = $-mue$

Kinetic energy of ball after collision

$=\frac{1}{2}\times m\times u^2e^2$

So neither momentum nor mechanical energy of ball is conserved.

Momentum of system (ball + earth) is conserved as there is no external force.

(NEW NCERT 11th Page No. 83, 86)

8. (1)

Three atoms of $B \rightarrow$ one atom of A

$\therefore\ Q=E_a-3E_b$

(NEW NCERT 12th Page No. 310, 312)

9. (4)

For $R_1 = 6\Omega$, circuit will be balanced Wheatstone bridge, current through R will be zero.

(NEW NCERT 12th Page No. 100, 101)

10. (3)

M' = mass of remaining part of ring

$=\frac{360-45}{360}\times M$

$M' = \frac{315}{360}M$

$M' = \frac{7}{8}M$

MOI of remaining part of ring

$= M' \times R^2$

$= \frac{7}{8}MR^2$

So $K = \frac{7}{8}$

(NEW NCERT 11th Page No. 114, 116)

11. (4)

$l = l_0(1 + \alpha\Delta T)$

$5.01 = 5\ (1 + 100\alpha)$

$\alpha = 2 \times 10^{-5}\ /°C$

(NEW NCERT 11th Page No. 204, 205)

12. (2)

$\mu \propto \frac{1}{\lambda} \Rightarrow \frac{\mu_{vaccum}}{\mu_{medium}} = \frac{\lambda_{medium}}{\lambda_{vaccum}}$

$\mu_{medium} = 2$

(NEW NCERT 12th Page No. 259)

13. (4)

At $t = 1$, $i = 7A$, $\frac{di}{dt} = 5$ A/s

$V_P - 7 \times 5 - 2 \times 5 - 10 - V_Q = 0$

$V_P - V_Q = 55\,V$

(NEW NCERT 12th Page No. 168)

14. (3)

From continuity equation and Bernoulli's principle.

$P + \frac{1}{2}\rho v^2 = \text{constant}$ …(i)

And $A_1v_1 = A_2v_2$ (ii)

Where area is less velocity is more and hence pressure is less.

(NEW NCERT 11th Page No. 187, 188)

15. (3)

$\because \gamma_2 < \gamma_1 \Rightarrow$ volume of cube increases more than the corresponding decrease in density of liquid. Hence the fraction of cube will decrease with increase in temperature of the system.

(NEW NCERT 11th Page No. 205)

16. (4)

$v = \frac{c}{\sqrt{\mu_r \varepsilon_r}} = \frac{3 \times 10^8}{\sqrt{8 \times 2}} = \frac{3}{4} \times 10^8$

7.5×10^7 m/s

(NEW NCERT 12th Page No. 207)

17. (2)

$\frac{1}{K_{eq}} = \frac{1}{3K} + \frac{1}{K}$

$K_{eq} = \frac{3K}{4}$

$T = 2\pi\sqrt{\frac{m}{K_{eq}}} = 2\pi\sqrt{\frac{4m}{3K}}$

(NEW NCERT 11th Page No. 267, 268)

18. (3)

$Q = \Delta U + W$

$Q = +40\,J$ $U_i = 50$ J

$W = +20\,J$

$Q = U_f - U_i + W$

$40 = U_f - 50 + 20$

$90 - 20 = U_f$

$U_f = 70\,J$

(NEW NCERT 11th Page No. 230)

19. (3)

When object is at *C* image is also at *C*

$\therefore u_1 = v_1 = -R$

$u_2 = \frac{-3R}{2}$

Then, $\frac{1}{v_2} + \frac{1}{u_2} = \frac{1}{f} \Rightarrow \frac{1}{\frac{-R}{2}} = \frac{1}{v_2} + \frac{1}{\frac{-3R}{2}}$

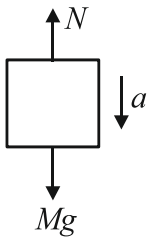
$\Rightarrow v_2 = \frac{-3R}{4}$

Image displaces from *R* to $\frac{3R}{4}$.

(NEW NCERT 12th Page No. 225)

20. (3)

FBD of block



$Mg - N = Ma$

$$N = \frac{Mg}{5}$$

So, $a = \dfrac{Mg - \dfrac{Mg}{5}}{M} = 0.8\,\text{g}$

(NEW NCERT 11th Page No. 65, 66)

21. (1)

$$\vec{\tau} = \vec{p} \times \vec{E}$$

$$\tau = (q \times r) \times \frac{\sigma}{2\varepsilon_0} \times \sin\theta = \frac{\sigma q r}{2\varepsilon_0}\sin\theta$$

(NEW NCERT 12th Page No. 27)

22. (3)

$$T = ml\omega^2 = ml4\pi^2 f^2$$

$$f^2 = \frac{T}{ml4\pi^2} = \frac{400}{5\times1\times4\pi^2} = \frac{20}{\pi^2}$$

$$f = \frac{2\sqrt{5}}{\pi}\,\text{rps}$$

(NEW NCERT 11th Page No. 68)

23. (4)

$$\frac{F}{\ell} = \frac{\mu_0 i_1 i_2}{2\pi d}$$

$$\frac{F}{\ell} = \frac{\mu_0}{2\pi} = 2\times10^{-7}\,\text{N/m}$$

(NEW NCERT 12th Page No. 122, 123)

24. (2)

$$C' = C$$

$$\frac{\varepsilon_0 A}{(d'-t)+\dfrac{t}{k}} = \frac{\varepsilon_0 A}{d}$$

or, $d = d' - t + \dfrac{t}{k}$

or, $d' = d + t - \dfrac{t}{k}$

$$= 4 + 3 - \frac{3}{3} = 6\,\text{mm}$$

(NEW NCERT 12th Page No. 69, 70)

25. (1)

For square plate *ABCD* center of mass is at *O*, but when two point masses of 5 kg are placed at *C* & *D*, then centre of mass shifts on the line *OH*, because center of mass is in that part which has higher mass and as combination of plate and point masses is still symmetrical about *FH* so the center of mass will not move along *DH* or *OG*.

(NEW NCERT 11th Page No. 95, 98)

26. (2)

$$\tau = MB\sin\theta$$

$$M = \frac{\tau}{B\times\sin\theta} = \frac{0.05\times2}{0.25} = 0.4\,\text{J}\,T^{-1}$$

(NEW NCERT 12th Page No. 139)

27. (1)

$$B_1 = B_{end} = \frac{\mu_0 ni}{2}$$

$$B_2 = B_{center} = \mu_0 ni$$

$$\frac{B_1}{B_2} = \frac{1}{2}$$

(NEW NCERT 12th Page No. 121, 122)

28. (1)

$$U = \frac{1}{2}CV^2 = \frac{1}{2}\times4\times10^{-6}\times(6)^2$$

= 200 μJ

(NEW NCERT 12th Page No. 73, 74)

29. (4)

$$\text{stress} = \frac{\text{force}}{\text{area}}$$

Both wires have same length and same cross-sectional area, force exerted on both wire will be same, therefore, stress is same for both aluminium and steel wire.

As Young modulus *Y* of steel wire is more than a aluminium wire. Therefore, strain is different for both wires as,

$$\text{Strain} = \frac{\text{stress}}{\text{Y}}$$

(NEW NCERT 11th Page No. 168, 169)

30. (4)

$$Z = \sqrt{R^2 + X_L^2}$$

$X_L = 2\pi fL$

$$Z = \sqrt{(30)^2 + \left(2\pi\times50\times\frac{0.4}{\pi}\right)^2} = 50\,\Omega$$

(NEW NCERT 12th Page No. 187)

31. (1)

For rigid container *V*= constant ⇒ *n* is fixed

Hence $\lambda = \dfrac{1}{\sqrt{2}\pi nd^2} \Rightarrow$ is independent of temperature

(NEW NCERT 11th Page No. 254, 255)

32. (3)

$(y_4)_{max} = \frac{4\lambda D}{d}, (y_3)_{min} = \frac{5\lambda D}{2d}$

$(y_4)_{max} - (y_3)_{min} = \left(4 - \frac{5}{2}\right)\frac{\lambda D}{d}$

$n\frac{\lambda D}{d} = \left(\frac{8-5}{2}\right)\left(\frac{\lambda D}{d}\right)$

$n = \frac{3}{2}$

$2n = 3$

(NEW NCERT 12th Page No. 265, 266)

33. (4)

When both A and B are low then no current flows through resistor and hence $Y = 0$. Now if any of A and B or both (A and B) become high then current starts flowing through resistor and output Y become high. Hence truth table becomes of OR gate.

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

(OLD NCERT 12th Page No. 502, 205)

34. (1)

For open pipe, $f_5 = \frac{5v}{2L} = \frac{5v}{2L} \Rightarrow 4^{th}$ overtone

For closed pipe, $f_9 = \frac{9v}{4L} = \frac{9v}{4L} \Rightarrow 4^{th}$ overtone

Now, $\frac{f_5}{f_9} = \frac{\frac{5v}{2L}}{\frac{9v}{4L}} = \frac{10}{9}$

(NEW NCERT 11th Page No. 289, 293)

35. (4)

$\because \Delta E = 13.6Z^2\left[\frac{1}{1^2} - \frac{1}{3^2}\right]$

$\Rightarrow \lambda \propto \frac{1}{Z^2}$

$\Rightarrow \lambda$ is minimum for doubly ionized Lithium

(NEW NCERT 12th Page No. 300, 301)

SECTION-B

36. (2)

$R = u\cos\theta \times T$

$R' = u\cos\theta \times T \times + \frac{1}{2}aT^2$

$= u\cos\theta \times T + \frac{1}{2}\frac{g}{6} \times \left(\frac{2u\sin\theta}{g}\right)^2$

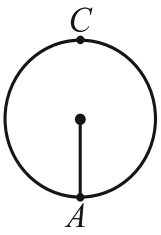
$= R + \frac{g}{12}.\frac{4u^2\sin^2\theta}{g^2}$

$= R + \frac{u^2\sin^2\theta}{3g}$

$R' = R + \frac{2H}{3}$

(NEW NCERT 11th Page No. 38, 40)

37. (1)



At lowest point A

$T_A = T_{max} = Mg + \frac{M \times v_A^2}{L}$

At highest point C

$T_C = T_{min} = \frac{Mv_C^2}{L} - Mg$

$\frac{T_{max}}{T_{min}} = \frac{Mg + \frac{Mv_A^2}{L}}{\frac{Mv_C^2}{L} - Mg} = \frac{g + \frac{v_A^2}{L}}{\frac{v_C^2}{L} - g}$ …(i)

from conservation of energy

$M\frac{v_A^2}{2} = \frac{Mv_C^2}{2} + (2L) \times Mg$

$v_A^2 = v_C^2 + 4gL$ …(ii)

$\frac{T_{max}}{T_{min}} = 3$ …(iii)

From (i), (ii) and (iii)

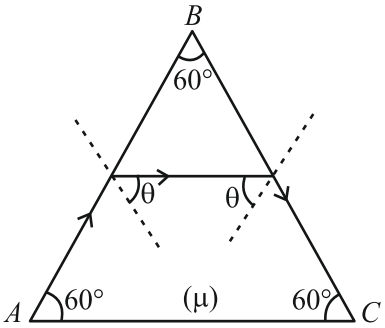
$v_C^2 = 4gL$

$= 4 \times 10 \times 2.5 = 100$

$v_c = 10$ m/s

(NEW NCERT 11th Page No. 79, 80)

38. (4)



$r_1 + r_2 = A$

$\theta + \theta = 60$

$\therefore\ \theta = 30°$

By applying Snell's law at *AB*

$1 \sin 90 = \mu \sin \theta$

$$\mu = \frac{1}{\sin\theta} = \frac{1}{\sin 30} = \frac{1}{\frac{1}{2}}$$

$\therefore\ \mu = 2$

(NEW NCERT 12th Page No. 239, 240)

39. (4)

According to Bernoulli's principle

$$P_1 + \frac{1}{2}\rho v_1^2 = P_2 + \frac{1}{2}\rho v_2^2$$

$$(P_1 - P_2) = \frac{1}{2}\rho(v_2^2 - v_1^2)$$

$$= \frac{1}{2} \times 1.3((70)^2 - (62)^2) = 686.4\ \text{Nm}^{-2}$$

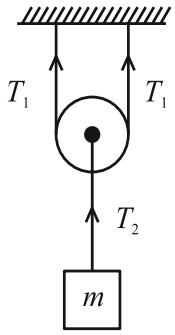
Lift force on the wing.

$$F = (P_1 - P_2)A = 686.4 \times 2.5$$

= 1716 N

(NEW NCERT 11th Page No. 188, 189)

40. (2)



$2T_1 = T_2$

Now, $\Delta L = \dfrac{FL}{AY}$

For same dimension and material $\Delta L \propto F$

$\Rightarrow\ \Delta l_2 = 2\Delta l_1 = 2l$

(NEW NCERT 11th Page No. 170)

41. (3)

Since no external torque is acting on the system

Angular momentum is conserved

$$mv_0R_0 = \frac{mvR_0}{4}$$

$v = 4v_0$

Final K.E. $= \dfrac{1}{2} \times m \times 16v_0^2$

$= 8mv_0^2$

(NEW NCERT 11th Page No. 108)

42. (1)

$$f - 10 = \frac{1}{2L}\sqrt{\frac{129.6}{\mu}} \quad \ldots(\text{i})$$

$$f = \frac{1}{2L}\sqrt{\frac{160}{\mu}}$$

$$\frac{f}{\sqrt{160}} = \frac{1}{2L\sqrt{\mu}}$$

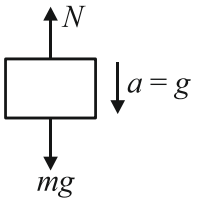
From equation (i), $f - 10 = \sqrt{\dfrac{129.6}{160}}\, f$

$f - 10 = 0.9f$

f = 100 Hz.

(NEW NCERT 11th Page No. 285 and 293, 294)

43. (3)



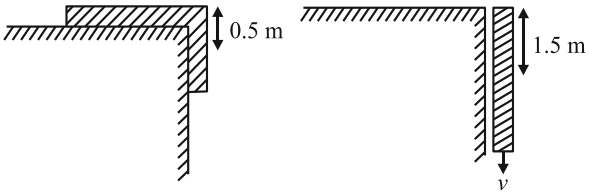
$mg - N = ma$

$N = mg - mg = 0$

As $N = 0$, so frictional force on the block is zero.

(NEW NCERT 11th Page No. 60)

44. (2)



From the figure

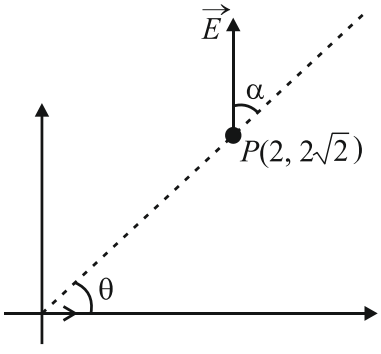
$$0 + \frac{mg}{3}(-0.5) = \frac{1}{2}mv^2 + mg(-1.5)$$

$$\Rightarrow\ 2g\left(1.5 - \frac{0.5}{3}\right) = v^2$$

$$\Rightarrow\ v = \sqrt{\frac{80}{3}}\ \text{m/s}$$

(NEW NCERT 11th Page No. 78, 79)

45. (3)



$\tan\theta = \frac{y}{x} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

$\tan\alpha = \frac{1}{2}\tan\theta = \frac{1}{2}.\sqrt{2} = \frac{1}{\sqrt{2}}$

$\Rightarrow \theta + \alpha = 90°$, $\vec{E}$ is along positive *y*-axis

(NEW NCERT 12th Page No. 23, 24)

46. (3)

Heat given by heater = heat absorbed by water

$\frac{V^2}{R}t = ms\Delta\theta$

$t = \frac{ms\Delta\theta.R}{V^2} = \frac{(100\times10^{-3})\times4200\times50\times484}{(220)^2}$

= 210 seconds

(NEW NCERT 11th Page No. 208, 209)

47. (1)

From mechanical energy conservation

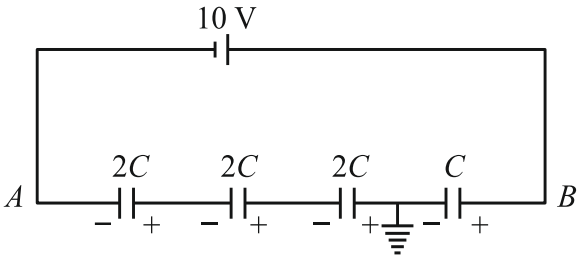
$0 + 0 = \frac{1}{2}mv^2 - \frac{3}{2}\frac{GMm}{R}$

$v = \sqrt{\frac{3GM}{R}} = \sqrt{1.5}\ v_e$

(NEW NCERT 11th Page No. 135, 136)

48. (3)

Effective capacitance $= \frac{2C}{5}$



Charge on system = $\frac{20C}{5} = 4C$

According to *K.V.L.*

$V_A + \frac{3q}{2C} = 0$

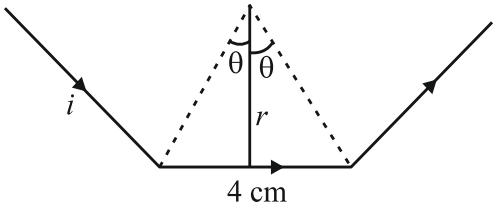
$V_A + \frac{3\times q}{2C} = 0$

$V_A = -\frac{3\times4C}{2C} = -6\text{V}$

And $V_B - \frac{q}{C} = 0 \Rightarrow V_B = 4\text{V}$

(NEW NCERT 12th Page No. 71, 73)

49. (1)



$\because \tan\theta = \frac{2}{r} = \tan30°$ ($\because\theta$ = 30° for hexagon)

$\Rightarrow r = 2\sqrt{3}$ cm

Magnetic field at centre due to each side

$\frac{\mu_0 i}{4\pi r}[\sin(30°) + \sin(30°)]$

$= \frac{10^{-7}\times4}{2\sqrt{3}\times10^{-2}}\left[\frac{1}{2} + \frac{1}{2}\right] = \frac{2}{\sqrt{3}}\times10^{-5}T$

Net magnetic field at centre due to complete hexagon $= 6\times\frac{2}{\sqrt{3}}\times10^{-5} = 4\sqrt{3}\times10^{-5}T$

(NEW NCERT 12th Page No. 113, 115)

50. (1)

Electric field due to infinitely long straight uniformly charged wire at a distance *r* from it is equal to $\frac{1}{2\pi\varepsilon_0}\frac{\lambda}{r}$

$E_1 = \frac{1}{2\pi\varepsilon_0}\frac{\lambda}{r}$

$E_2 = \frac{1}{2\pi\varepsilon_0}\frac{\lambda}{3r}$

$E_2 = \frac{E_1}{3}$

(NEW NCERT 12th Page No. 33, 34)

(CHEMISTRY)

SECTION-A

51. (2)

$Na_2S_4O_6$

$2(+1) + 4(x) + 6(-2) = 0$

$4x = +12 - 2$

$4x = 10$

(NEW NCERT 11th Part-II Page No. 245)

52. (4)

(1) Their compounds are generally coloured

(2) They can form ionic or covalent compounds

(3) Their melting and boiling points are high

All are correct statements.

(NEW NCERT 12th Part-I Page No. 93,103)

53. (1)

S_1: Maltose is reducing sugar.

S_2: Sucrose is an oligo saccharide.

S_3: A pair of diastereomeric aldoses which differ only in configuration at C-1 are anomers.

S_4: Oxidation of glucose by HNO_3 gives saccharic acid.

(NEW NCERT 12th Part-II Page No. 283,287)

54. (1)

Arrhenius equation is :

$$\log k = \log A - \frac{E_a}{2.303RT}$$

$$t_{1/2} = 20\,\text{min}, k = \frac{0.693}{20\times 60}$$

$= 5.77 \times 10^{-4}\,s^{-1}$

$$\frac{E_a}{2.303RT} = \log A - \log k$$

$$\frac{E_a}{2.303RT} = \log\frac{A}{k}$$

$$\frac{100\times 1000}{2.303\times 8.314\times T} = \log\frac{4\times 10^{10}}{5.77\times 10^{-4}}$$

$$T = \frac{100\times 1000}{2.303\times 8.314\times 13.84}$$

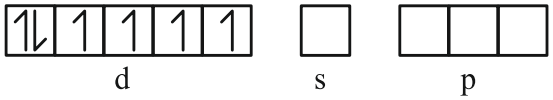
$T = 377.36$ K

(NEW NCERT 12th Part-I Page No. 80)

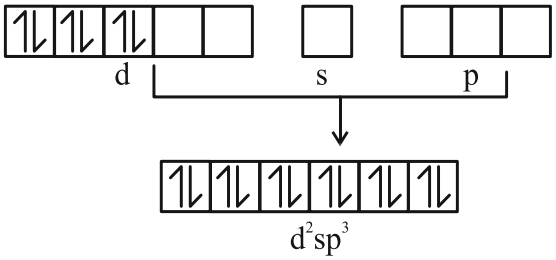
55. (2)

$[Co(NH_3)_6]^{3+}$

$Co^{3+} \rightarrow [Ar]3d^6$



In Co^{3+}, NH_3 act as strong ligand, so pairing takes palace.



Six electron pair from 6 NH_3. No unpaired electron, so diamagnetic and low spin complex.

(NEW NCERT 12th Part-I Page No. 132)

56. (3)

$Cr^{2+}(z = 24)$: $[Ar]3d^4 4s^0$ four unpaired electrons

$Fe^{2+}(z = 26)$:$[Ar]3d^6 4s^0$ four unpaired electrons

So, Cr^{2+} and Fe^{2+} have the same value of magnetic moment.

(NEW NCERT 12th Part-I Page No. 102)

57. (2)

(1) $Cl{-}CH_2{-}\underset{\displaystyle CH_3}{\underset{|}{CH}}{-}CH_2{-}CH_3$

(2) $CH_3{-}\overset{\displaystyle Cl}{\overset{|}{\underset{\displaystyle CH_3}{\underset{|}{C}}}}{-}CH_2{-}CH_3$

(3) $CH_3{-}\underset{\displaystyle CH_3}{\underset{|}{CH}}{-}\underset{\displaystyle Cl}{\underset{|}{CH}}{-}CH_3$

(4) $CH_3{-}\underset{\displaystyle CH_3}{\underset{|}{CH}}{-}CH_2{-}CH_2{-}Cl$

(NEW NCERT 11th Part-II Page No. 302)

58. (2)

Basicity α Electron releasing group, and α $\frac{1}{\text{Electron withdrawing group}}$, so the correct order is : II < I < III < IV

(NEW NCERT 12th Part-II Page No. 260)

59. (1)

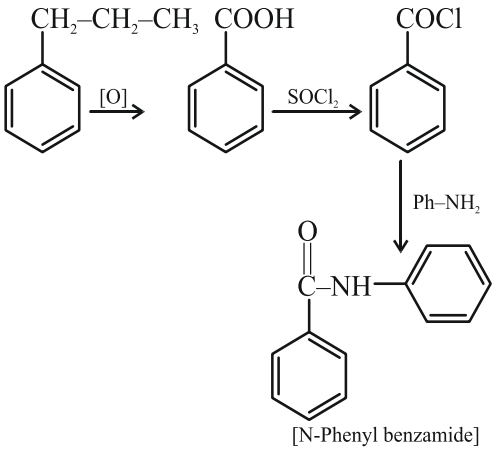
$$\text{Molality } (m) = \frac{w_B\times 1000}{M.M\times W}$$

$$b = \frac{c\times 1000}{M.M\times(a-c)}$$

$$M.M = \frac{c\times 1000}{b(a-c)}$$

(NEW NCERT 11th Part-I Page No. 24)

60. (2)



[N-Phenyl benzamide]

(NEW NCERT 12th Part-II Page No. 146,246)

61. (4)

(1) A dipeptide has one peptide link between two amino acids.

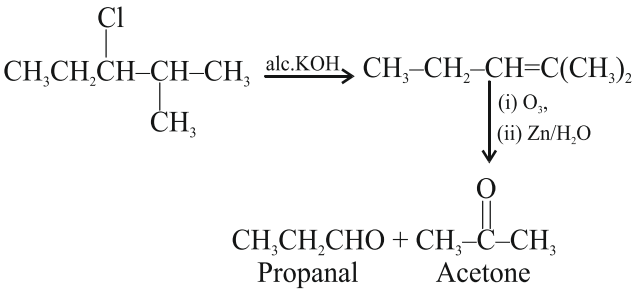
(2) By convention N-Terminus is kept at left and C-terminus at right in the structure of a peptide.

(3) If only one amino group and one carboxylic acid, group are available for reaction, then only one dipeptide can forms.

All are correct statements.

(NEW NCERT 12th Part-II Page No. 292)

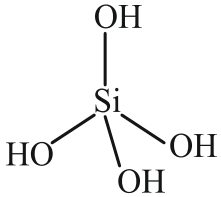
62. (1)



(NEW NCERT 11th Part-II Page No. 310,313)

63. (1)

CCl_4 does not hydrolysed due to absence of d-orbital.



Total number of sigma bond in silicic acid is 8.

(OLD NCERT 11th Part-II Page No. 324,325)

64. (2)

$$\frac{E_5}{E_2}=\left(\frac{n_1}{n_2}\right)^2$$

$$\frac{E_5}{E_2}=\frac{(2)^2}{(5)^2}=\frac{4}{25}$$

$$E_5=\frac{4}{25}\times E_2$$

$$E_5=\frac{-4\times 300}{25}$$

$E_5 = -48$ kJ mol^{-1}

(NEW NCERT 11th Part-I Page No. 48)

65. (2)

Fructose reduces Fehling solution and Tollen's regent and in fructose the carbonyl group is present at C-2 carbon atom.

(NEW NCERT 12th Part-II Page No. 283)

66. (3)

$\pi = iCRT$

$\pi_1 = \pi_2$

$$\frac{n_1}{V_1}=\frac{n_2}{V_2}$$

$$\frac{10}{342}=\frac{2}{M.M}$$

$$M.M=\frac{2\times 342}{10}=68.4 \text{ g mol}^{-1}$$

(NEW NCERT 12th Part-I Page No. 21)

67. (4)

Only 1° and 2° amines react with benzenesulphonyl chloride.

(NEW NCERT 12th Part-II Page No. 271)

68. (4)

(1) BF_3 has zero dipole moment while NH_3 has non zero dipole moment.

(2) Dipole moment of NH_3 is greater than that of BF_3.

(3) BF_3 molecule is planar, while the NH_3 is pyramidal in shape.

(4) All are correct statement.

(NEW NCERT 11th Part-I Page No. 111,112,115)

69. (2)

For 0.4M solution : R = 100 Ω

$$G=\frac{1}{R}=\frac{1}{100}$$

$$\kappa = G\,G^*,\ G^*=\frac{\kappa}{G}$$

$$G^*=\frac{2.6}{\frac{1}{100}}=260 \text{ m}^{-1}$$

For 0.8M solution : R = 520 Ω

$$G = \frac{1}{520}$$

$$\kappa = G \times G^*$$

$$\kappa = \frac{1 \times 2.6 \times 10^2}{520}$$

$$\kappa = 0.5 \text{ S m}^{-1}$$

$$\lambda_m = \frac{\kappa}{1000 \times M} = \frac{0.5}{1000 \times 0.8}$$

$\lambda_m = 6.25 \times 10^{-4}$ S m^2 mol^{-1}

(NEW NCERT 12th Part-I Page No. 41)

70. (3)

Sulphur trioxide and phosphorus pentaoxide both are acidic in nature.

(OLD NCERT 11th 12th Part-I Page No. 328,174,185)

71. (1)

(A)	11 g of CO_2	(IV)	0.25
(B)	6.022×10^{21} molecules of CO_2	(II)	0.01
(C)	11.2 L of CO_2 at S.T.P	(III)	0.5
(D)	4.9 g of H_2SO_4	(I)	0.05

(NEW NCERT 11th Part-I Page No. 20)

72. (3)

Carbylamine on reduction gives 2° amine.

$$RNC \xrightarrow{H_2/Ni} \underset{(2° \text{amine})}{R - NH - CH_3}$$

(NEW NCERT 12th Part-II Page No. 262)

73. (3)

Higher the number of ions produced in solution higher is the osmotic pressure according to relation,

$\pi = iCRT$

Glucose $\rightarrow$ does not dissociate in solution

$NaCl \rightarrow Na^+ + Cl^- \rightarrow$ 2 ions

$BaCl_2 \rightarrow Ba^{2+} + 2Cl^- \rightarrow$ 3 ions

$AlCl_3 \rightarrow Al^{3+} + 3Cl^- \rightarrow$ 4 ions

(NEW NCERT 12th Part-I Page No. 21)

74. (1)

$$\lambda_{eq} = \frac{\kappa \times 1000}{N}, \kappa = G \times G^*, G = \frac{1}{R}$$

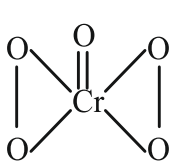
$$\kappa = \frac{G^*}{R}$$

$$\lambda_{eq} = \frac{G^* \times 1000}{R \times N}$$

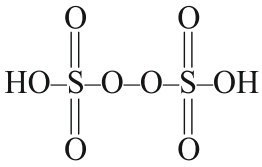
$$\lambda_{eq} = \frac{1 \times 1000}{100 \times 2} = 5\,\Omega^{-1} \text{ cm}^2 \text{ g equiv}^{-1}$$

(NEW NCERT 12th Part-I Page No. 45)

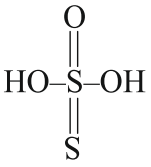
75. (4)



(I)



(II)



(III)

So, (I) and (II) have (–O–O–) linkage.

(OLD NCERT 12th Part-I Page No. 189)

76. (4)

$$K_C' = \left(\frac{1}{K_C}\right)^{1/2}$$

$$K_C' = \left(\frac{1}{3.6 \times 10^{-10}}\right)^{1/2}$$

$$K_C' = \left(\frac{1000}{36} \times 10^8\right)^{1/2}$$

$$K_C' = 5.27 \times 10^4$$

(NEW NCERT 11th Part-I Page No. 176)

77. (1)

$H_2(g) + Cl_2(g) \rightarrow 2HCl(g)$

$$\Delta S^0 = \sum S_P^0 - \sum S_R^0 = 2 \times 190 - (130 + 225)$$

$\Delta S^0 = 25$ J K^{-1} mol^{-1}

(NEW NCERT 11th Part-I Page No. 159)

78. (3)

$$(CH_3)_2CHC \equiv CCH_2CH_3 \xrightarrow[KMnO_4]{\text{hot acidic}} (CH_3)_2CHCOOH + CH_3CH_2COOH$$

2-Methyl-3-hexyne

(NEW NCERT 11th Part-II Page No. 313)

79. (3)

$M^{3+} + 3e^- \rightarrow M : \Delta G° = -3 \times F(-0.040)$

$\Delta G° = 3 \times 0.040$ F….(I)

$M \rightarrow M^{2+} + 2e^- : \Delta G° = -2 \times F \times 0.44$ ….(II)

Add equation (I) and (II)

$M^{3+} + e^- \rightarrow M^{2+}$, $\Delta G° = (3 \times 0.040F - 2 \times 0.44F)$

$-1 \times F \times E° = -0.76$ F

$E° = 0.76$ V

(NEW NCERT 12th Part-I Page No. 40)

80. (3)

$2NO + O_2 \rightarrow 2NO_2$

2 moles of NO_2 contains = 32 g of O_2

92 g of NO_2 contains = 32 g of O_2

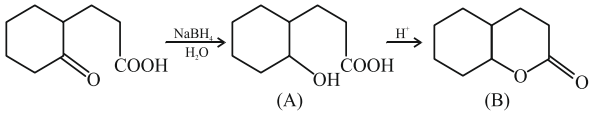
1 g of NO_2 contains = $\frac{32}{92}$ g of O_2

20 g of NO_2 contains = $\frac{32}{92} \times 20$ g of O_2

= 6.95 g of O_2

(NEW NCERT 11th Part-I Page No. 21)

81. (4)



(NEW NCERT 12th Part-II Page No. 200,247)

82. (2)

I 2-Chloroethanoic acid is more acidic then ethanoic acid due to –I effect of chlorine.

II As + I of alkyl groups increase, acidic strength decreases.

III alkynes are more acidic than alkenes and alkanes due to sp-hybridisation, of carbon atom which act as electron withdrawing.

(NEW NCERT 12th Part-II Page No. 251)

83. (1)

No. of moles in 10 L water $= \frac{10000}{18}$

Degree of ionisation $= \frac{10^{-8}}{\frac{10000}{18}} \times 100$

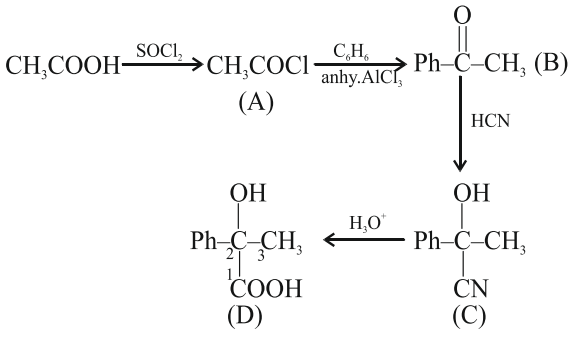
$= \frac{10^{-8} \times 100 \times 18}{10000}$

$= 18 \times 10^{-10}$

$1.8 \times 10^{-9}\%$

(NEW NCERT 11th Part-I Page No. 193)

84. (1)

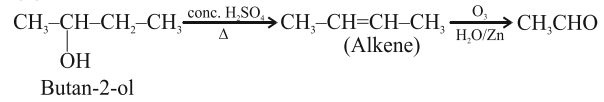


2-Hydroxy-2-phenyl-propanoic acid

(NEW NCERT 12th Part-II Page No. 185,164)

SECTION-B

85. (1)



Butan-2-ol

(NEW NCERT 11th12th Part-II Page No. 208,313)

86. (4)

(1) and (3) both give tribromo derivative on reaction with bromine water because –OH activates the ring via strong +M effect at ortho and para position.

(NEW NCERT 12th Part-II Page No. 212)

87. (4)

$\% \text{ of } S = \frac{32 \times \text{wt. of } BaSO_4 \times 100}{233 \times \text{wt. of organic compund}}$

$= \frac{32 \times 1.20}{233 \times 0.59} \times 100 = 27.93\%$

(NEW NCERT 11th Part-II Page No. 289)

88. (4)

Paramagnetism is observed due to the presence of unpaired electrons.

$N_2^+ \rightarrow 1$ unpaired electron, paramagnetic in nature

$O_2 \rightarrow 2$ unpaired electron, paramagnetic in nature

$O_2^{2-} \rightarrow 0$ unpaired electron, diamagnetic in nature

(NEW NCERT 11th Part-I Page No. 129)

89. (3)

$\Delta U = q + W$….(1)

q = +1600 J

$W = -P_{ext}(V_2 - V_1)$

$= -2(40 - 20)$

$= -40 \text{ dm}^3 \text{ atm}$

$= -40 \times 101.3$ J

$= -4052$ J

Put value of q and W in equation (1)

$\Delta U = +1600 - 4052$

$\Delta U = -2452$ J

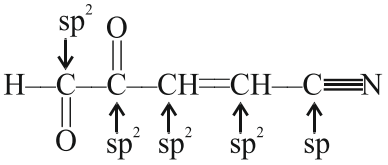
(NEW NCERT 11th Part-I Page No. 142,143)

90. (1)

Number of orbitals = $n^2 = (4)^2 = 16$

(NEW NCERT 11th Part-I Page No. 55)

91. (2)



(NEW NCERT 11th Part-I Page No. 120)

92. (1)

$$r_1 = k[A][B] = k\left[\frac{n_A}{V}\right]\left[\frac{n_B}{V}\right]$$

$$r_2 = k\left[\frac{\frac{n_A}{V}}{8}\right]\left[\frac{\frac{n_B}{V}}{8}\right] = 64k\left[\frac{n_A}{V}\right]\left[\frac{n_B}{V}\right]$$

$$r_2 = 64r_1$$

(NEW NCERT 12th Part-I Page No. 67)

93. (4)

(1) ΔH_3 is more negative than ΔH_1 and ΔH_2 because the electron gain enthalpy of chlorine is highest.

(2) ΔH_1 is less negative than ΔH_2 because electron gain enthalpy of fluorine is more than that of oxygen.

(3) ΔH_4 is positive because electron inters into already half filled stable electronic configuration of nitrogen atom.

(NEW NCERT 11th Part-I Page No. 89)

94. (1)

$$2H_2(g) + 2CO_2(g) \rightleftharpoons 2CO(g) + 2H_2O(g)$$

Initial	2	2	0	0
At eq^n	2 – y	2 – y	y	y

$$K_C = \frac{[CO]^2[H_2O]^2}{[H_2]^2[CO_2]^2} = \frac{(y^2)(y^2)}{(2-y)^2(2-y)^2}$$

$$K_C = \frac{y^4}{(2-y)^4}$$

(NEW NCERT 11th Part-I Page No. 178)

95. (4)

(1) $CH_3CBr_2CHBr_2 \xrightarrow{\text{Zn dust}} CH_3C{\equiv}CH$

(2) $CH_3CH_2CHBr_2 \xrightarrow{\text{alc.KOH}} CH_3CH{=}CHBr \xrightarrow{NaNH_2} CH_3C{\equiv}CH$

(3) $CH_3CHBrCH_2Br \xrightarrow[2\text{ eq.}]{NaNH_2} CH_3C \equiv CH$

So, all gives alkynes.

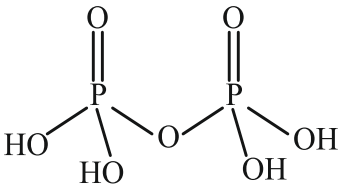
(NEW NCERT 11th Part-II Page No. 310,316)

96. (3)

$$CH_3CH_2CH_2{-}OH \xrightarrow{KMnO_4} CH_3CH_2COOH \xrightarrow[\Delta]{NaOH + CaO} CH_3{-}CH_3 + CO_2$$

(NEW NCERT 11th Part-II Page No. 301)

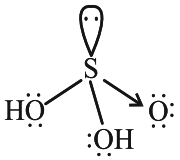
97. (3)



Basicity is four and number of P–O–P bond is one.

(OLD NCERT 12th Part-I Page No. 179)

98. (2)



Number of lone pair is equal to 8 and number of coordinate bond is one.

(OLD NCERT 12th Part-II Page No. 190)

99. (1)

(A)	Fe_3O_4	(IV)	$+\frac{8}{3}$
(B)	P_4O_{10}	(III)	+5
(C)	C_3O_2	(II)	$+\frac{4}{3}$
(D)	CrO_5	(I)	+6

(NEW NCERT 11th Part-II Page No. 239,245)

100. (4)

(1) Ca^{2+}, Cl^-, S^{2-} → all have 18 electrons.

(2) N^{3-}, F^-, Na^+ → all have 10 electrons.

(NEW NCERT 11th Part-I Page No. 87)

(BOTANY)

SECTION-A

101. (2)
Geitonogamy is functionally cross-pollination involving a pollinating agent, genetically it is similar to autogamy since the pollen grains come from the same plant.
(NEW NCERT 12th Page No. 12)

102. (2)
Conversion of glucose into glucose 6-phosphate-ATP is utilised.
(NEW NCERT 11th Page No. 156)

103. (4)
The C_3 and C_4 plants respond differently to CO_2 concentrations. At low light conditions neither group responds to high CO_2 conditions.
(NEW NCERT 11th Page No. 149, 150)

104. (1)
The endomembrane system include endoplasmic reticulum (ER), golgi complex, lysosomes and vacuoles because their functions are co-ordinated.
(NEW NCERT 11th Page No. 95)

105. (3)
Xylem parenchyma cells are living and thin walled, and their cell wall are made up of cellulose. Tracheid's, vessels and sclerenchyma tissues are dead and are without protoplasm.
(OLD NCERT 11th Page No. 87)

106. (1)
Methane is the predominant gas present in the biogas mixture. Certain bacteria grow under anaerobic conditions and produce a large amount of methane along with carbon dioxide and hydrogen. The bacteria which produce the gaseous mixture are collectively known as methanogens.
(NEW NCERT 12th Page No. 155)

107. (4)

Character	Recessive trait
Pod shape	Constricted
Pod colour	Yellow
See shape	Wrinkled
Seed colour	Green

(NEW NCERT 12th Page No. 55)

108. (2)
The final stage of meiotic prophase I is diakinesis. This is marked by terminalisation of chiasmata.
(NEW NCERT 11th Page No. 126)

109. (3)
Mycelium is branched & septate in ascomycetes, deuteromycetes, basidiomycetes.
(NEW NCERT 11th Page No. 17, 18)

110. (1)
Morgan coined the term linkage to describe the physical association of genes on a chromosome, and recombination to describe the generation of non-parental gene combinations.
(NEW NCERT 12th Page No. 67)

111. (4)
In the process of glycolysis, one molecule of glucose breaks down to form two molecules of pyruvate. Sucrose is a disaccaride so when it will break it will break into 4 pyruvic acid.
(NEW NCERT 11th Page No. 155)

112. (3)
The factor that is responsible for extension growth of plant cells is water.
(NEW NCERT 11th Page No. 171)

113. (1)
In some organisms karyokinesis is not followed by cytokinesis as a result of which multinucleate condition arises leading to the formation of syncytium (e.g., liquid endosperm in coconut).
Cell growth results in disturbing the ratio between the nucleus and the cytoplasm. It therefore becomes essential for the cell to divide to restore the nucleo-cytoplasmic ratio.
(NEW NCERT 11th Page No. 124, 125)

114. (1)
Because the respiratory pathway is involved in both anabolism and catabolism, it would hence be better to consider the respiratory pathway as an amphibolic pathway rather than as a catabolic one.
(NEW NCERT 11th Page No. 162)

115. (3)
The alleles I^A and I^B produce a slightly different form of the sugar while allele *i* does not produce any sugar.
(NEW NCERT 12th Page No. 61)

116. (3)
Bryophytes are found commonly growing in moist shaded areas in the hills. They can live in soil but are dependent on water for sexual reproduction and are thallus-like and prostrate or erect and attached to the substratum by rhizoids.
(NEW NCERT 11th Page No. 29)

117. (3)
When male gametes of rice plant have 10 chromosomes in their nucleus, the chromosome number in the female gamete, zygote and the cells of the seedling will be, respectively:10, 20, 20.
(NEW NCERT 12th Page No. 7, 11)

118. (2)
Gibberellins and Abscisic Acid (ABA) are antagonistic to each other.
Gibberllins promotes seed germination whereas ABA promotes seed dormacy.
(NEW NCERT 11th Page No. 178)

119. (4)
A nitrogenous base is linked to the OH of 1' C pentose sugar through a N-glycosidic linkage to form a nucleoside. Uracil is present in RNA at the place of Thymine. When a phosphate group is linked to OH of 5' C of a nucleoside through phosphoester linkage, a corresponding nucleotide (or deoxynucleotide depending upon the type of sugar present) is formed.
(NEW NCERT 11th Page No. 80, 81)

120. (3)
The size of a population for any species is not a static parameter.
Emigration is the number of individuals of the population who left the habitat and gone elsewhere during the time period under consideration.
(NEW NCERT 12th Page No. 191, 193)

121. (3)
If fatty acids were to be respired they would first be degraded to acetyl CoA and enter the pathway.
(NEW NCERT 11th Page No. 162)

122. (3)
In human beings, the membrane of the RBCs has approximately 40 percent lipids and 52 percent proteins.
(NEW NCERT 11th Page No. 93)

123. (3)
The coding sequences or expressed sequences are defined as exons. Introns or intervening sequences do not appear in mature or processed RNA.
hnRNA undergoes additional processing called as capping and tailing. In capping an unusual nucleotide (methyl guanosine triphosphate) is added to the 5'-end of hnRNA. In tailing, adenylate residues (200-300) are added at 3'-end in a template independent manner.
(NEW NCERT 12th Page No. 95)

124. (1)
Primary xylem is of two types – protoxylem and metaxylem. The first formed primary xylem elements are called protoxylem and the later formed primary xylem is called metaxylem.
In stems, the protoxylem lies towards the centre (pith) and the metaxylem lies towards the periphery of the organ. This type of primary xylem is called endarch.
In roots, the protoxylem lies towards periphery and metaxylem lies towards the centre. Such arrangement of primary xylem is called exarch.
(OLD NCERT 11th Page No. 87)

125. (3)
Dinoflagellates have two flagella; one lies longitudinally and the other transversely in a furrow between the wall plates. The walls of diatoms are embedded with silica and thus the walls are indestructible.
(NEW NCERT 11th Page No. 15)

126. (1)
The predominant stage of the life cycle of a moss is the gametophyte which consists of two stages. The first stage is the protonema stage, which develops directly from a spore.
(NEW NCERT 11th Page No. 30)

127. (1)

Ascomycetes	*Neurospora*
Phycomycetes	*Albugo*
Basidiomycetes	*Ustilago*
Deuteromycetes	*Colletotrichum*

(NEW NCERT 11th Page No. 17, 18)

128. (3)
In Oswald Avery, Colin MacLeod and Maclyn McCarty experiment, digestion with DNase did inhibit transformation of R cells, suggesting that the DNA caused the transformation.
(NEW NCERT 12th Page No. 85)

129. (2)
AUG has dual functions. It codes for Methionine (met), and it also act as initiator codon.
UAA, UAG, UGA are stop terminator codons.
(NEW NCERT 12th Page No. 96)

130. (2)
The annual net primary productivity of the whole biosphere is approximately 170 billion tons (dry weight) of organic matter.
(NEW NCERT 12th Page No. 207)

131. (3)
Inclusion bodies are not bound by any membrane system and lie free in the cytoplasm. The materials to be packaged from ER fuse with the *cis* face of the golgi apparatus and move towards the maturing face.
(NEW NCERT 11th Page No. 91, 96, 100)

132. (1)
The possibility of a female becoming a haemophilic is extremely rare because mother of such a female has to be at least carrier and the father should be haemophilic (unviable in the later stage of life.
(NEW NCERT 12th Page No. 74)

133. (4)
The lamina or the leaf blade is the green expanded part of the leaf with veins and veinlets.
(NEW NCERT 11th Page No. 60)

134. (4)

Lactose is the substrate for the enzyme beta-galactosidase and it regulates switching on and off of the *lac* operon.

(NEW NCERT 12th Page No. 101)

135. (1)

The primary CO_2 acceptor is a 3-carbon molecule phosphoenol pyruvate (PEP) and is present in the mesophyll cells.

(NEW NCERT 11th Page No. 146)

SECTION-B

136. (3)

By the process of leaching water- soluble inorganic nutrients go down into the soil horizon and get precipitated as unavailable salts.

Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called as catabolism.

(NEW NCERT 12th Page No. 208)

137. (2)

Some examples of recent extinctions include the dodo (Mauritius), quagga (Africa), thylacine (Australia), Steller's Sea Cow (Russia) and three subspecies (Bali, Javan, Caspian) of tiger.

(NEW NCERT 12th Page No. 221)

138. (4)

India now has 14 biosphere reserves, 90 national parks and 448 wildlife sanctuaries.

(NEW NCERT 12th Page No. 225)

139. (4)

As electrons move through the photosystems, protons are transported across the membrane. This happens because the primary accepter of electron which is located towards the outer side of the membrane transfers its electron not to an electron carrier but to an H carrier.

(NEW NCERT 11th Page No. 141)

140. (2)

Some cells in the adult animals do not appear to exhibit division (e.g., heart cells) and many other cells divide only occasionally, as needed to replace cells that have been lost because of injury or cell death. These cells that do not divide further exit G_1 phase to enter an inactive stage called quiescent stage (G_0) of the cell cycle. Cells in this stage remain metabolically active but no longer proliferate unless called on to do so depending on the requirement of the organism.

(NEW NCERT 11th Page No. 122)

141. (3)

Xylem fibres have highly thickened walls and obliterated central lumens.

(OLD NCERT 11th Page No. 87)

142. (3)

Single membrane bound cellular structure is lysosome, double membrane bound structures are mitochondria and nucleus and non-membrane bound structure is ribosome.

(NEW NCERT 11th Page No. 134-136)

143. (3)

Totally unrelated species could also compete for the same resource.

(NEW NCERT 12th Page No. 198)

144. (2)

The members of rhodophyceae are commonly called red algae. The food is stored as floridean starch which is very similar to amylopectin and glycogen in structure. Sexual reproduction is oogamous and accompanied by complex post fertilisation developments.

(NEW NCERT 11th Page No. 27)

145. (3)

Sugarcane stores carbohydrate as sugar in their stems. Spraying sugarcane crop with gibberellins increases the length of the stem, thus increasing the yield by as much as 20 tonnes per acre.

(NEW NCERT 11th Page No. 176)

146. (4)

Epipetalous	Brinjal
Polyadelphous	Citrus
Diadelphous	Pea
Monoadelphous	China rose

(NEW NCERT 11th Page No. 64)

147. (3)

Fungi are also known to form symbiotic associations with plants Mycorrhiza.

(NEW NCERT 12th Page No. 158)

148. (3)

Scutellum	Large shield-shaped structure
Coleoptile	Leaf primordia enclosed in a hollow foliar structure
Coleorrhiza	Radical enclosed in an undifferentiated sheath
Epicotyl	Terminates with the stem tip

(NEW NCERT 12th Page No. 19, 20)

149. (3)

Cultivation of hybrids has tremendously increased productivity. One of the problems of hybrids is that hybrid seeds have to be produced every year.

(NEW NCERT 12th Page No. 23)

150. (2)

Genus *Panthera*, comprising lion, tiger, leopard is put along with genus, *Felis* (cats) in the family Felidae.

(NEW NCERT 11th Page No. 07)

(ZOOLOGY)

SECTION-A

151. (1)

The malignant tumors, are a mass of proliferating cells called neoplastic or tumor cells. These cells grow very rapidly, invading and damaging the surrounding normal tissues. As these cells actively divide and grow they also starve the normal cells by competing for vital nutrients. Cells sloughed from such tumors reach distant sites through blood, and wherever they get lodged in the body, they start a new tumor there. This property called metastasis is the most feared property of malignant tumors.

(NEW NCERT 12th Page No. 141)

152. (2)

During post- industrialisation period, the tree trunks became dark due to industrial smoke and soots. Under this condition the white-winged moth did not survive due to predators, dark-winged or melanised moth survived.

(NEW NCERT 12th Page No. 116)

153. (4)

PCR stands for Polymerase Chain Reaction. In this reaction, multiple copies of the gene (or DNA) of interest is synthesised *in vitro* using two sets of primers (small chemically synthesised oligonucleotides that are complementary to the regions of DNA) and the enzyme DNA polymerase. This method increases the amount of DNA available for testing.

(NEW NCERT 12th Page No. 172)

154. (1)

In amniocentesis some of the amniotic fluid of the developing foetus is taken to analyse the fetal cells and dissolved substances. This procedure is used to test for the presence of certain genetic disorders such as, down syndrome, haemophilia, sickle-cell anemia, etc., determine the survivability of the foetus.

(NEW NCERT 12th Page No. 42)

155. (2)

The class name Reptilia refers to their creeping or crawling mode of locomotion. They are mostly terrestrial animals and their body is covered by dry and cornified skin, epidermal scales or scutes.

(NEW NCERT 11th Page No. 49)

156. (4)

Each organised skeletal muscle in our body is made of a number of muscle bundles or fascicles held together by a common collagenous connective tissue layer called fascia.

(NEW NCERT 11th Page No. 219)

157. (2)

PCT causes selective secretion of hydrogen ions and ammonia into the filtrate. DCT causes selective secretion of hydrogen, potassium ions and NH_3 to maintain the pH and sodium-potassium balance in blood. Collecting duct causes selective secretion of H^+ and K^+ ions. Loop of Henle does not cause selective secretion.

(NEW NCERT 11th Page No. 209, 210)

158. (3)

The process of attachment of blastocyst to the uterine wall is called implantation. The mitotic division starts as the zygote moves through the isthmus of the oviduct called cleavage towards the uterus and forms 2, 4, 8, 16 daughter cells called blastomeres. The embryo with 8 to 16 blastomeres is called a morula. The morula continues to divide and transforms into blastocyst. This blastocyst becomes embedded in the endometrium of uterus.

(NEW NCERT 12th Page No. 36, 37)

159. (3)

During glomerular filtration blood is filtered so finely through these membranes, that almost all the constituents of the plasma except the proteins (such as albumins) pass onto the lumen of the Bowman's capsule. Therefore, it is considered as a process of ultra filtration.

(NEW NCERT 11th Page No. 208)

160. (4)

Every 100 ml of deoxygenated blood delivers approximately 4 ml of CO_2 to the alveoli. 5L of deoxygenated blood deliver 200 ml of CO_2 to the alveoli.

(NEW NCERT 11th Page No. 190)

161. (4)

Simple epithelium is composed of a single layer of cells and functions as a lining for body cavities, ducts, and tubes. On the basis of structural modification of the cells, simple epithelium is further divided into three types. These are (i) Squamous, (ii) Cuboidal, (iii) Columnar. Compound epithelium is made of more than one layer (multi-layered) of cells. They cover the dry surface of the skin, the moist surface of buccal cavity, pharynx, inner lining of ducts of salivary glands and of pancreatic ducts.

(Old NCERT 11th Page No. 101, 102)

162. (2)

The thyroid gland is composed of two lobes which are located on either side of the trachea. Both the lobes are interconnected with a thin flap of connective tissue called isthmus. The thyroid gland is composed of follicles and stromal tissues.

(NEW NCERT 11th Page No. 242)

163. (2)

Chemical analysis is performed by taking any living tissue (a vegetable or a piece of liver, etc.) and grind it in trichloroacetic acid (Cl_3CCOOH) using a mortar and a pestle.

(**NEW NCERT 11th Page No. 104)**

164. (4)

The common reasons for producing transgenic animals are: normal physiology and development, study of diseases, biological products, vaccine safety and chemical safety testing. Transgenic animals are not used for early diagnosis of diseases.

(NEW NCERT 12th Page No. 183, 184)

165. (2)

A nerve impulse is transmitted from one neuron to another through junctions called synapses. A synapse is formed by the membranes of a pre-synaptic neuron and a post- synaptic neuron, which may or may not be separated by a gap called synaptic cleft.

(NEW NCERT 11th Page No. 234)

166. (1)

The male accessory glands include paired seminal vesicles, a prostate and paired bulbourethral glands. Secretions of these glands constitute the seminal plasma which is rich in fructose, calcium and certain enzymes. The secretions of bulbourethral glands also helps in the lubrication of the penis.

(NEW NCERT 12th Page No. 28)

167. (1)

Labeo and *Exocoetus* belongs to class Osteichthyes. *Labeo* is fresh water whereas *Exocoetus* is marine. *Trygon* and *Carcharodon* belongs to class Chondrichthyes which include marine animals.

(NEW NCERT 11th Page No. 48)

168. (1)

Wuchereria is triploblastic and pseudocoelomate animal. *Hirudinaria* is triploblastic and coelomate animal. *Fasciola* is triploblastic and acoelomate animal. *Anopheles* is triploblastic and coelomate animal.

(NEW NCERT 11th Page No. 42, 43, 44)

169. (4)

Rete testis, seminiferous tubules and testicular lobules are present inside testes whereas vas deferens is an accessory duct which is present outside the testis.

(NEW NCERT 12th Page No. 27)

170. (2)

The pars distalis region of pituitary, commonly called anterior pituitary, produces growth hormone (GH), prolactin (PRL), thyroid stimulating hormone (TSH), adrenocorticotrophic hormone (ACTH), luteinizing hormone (LH) and follicle stimulating hormone (FSH). Pars intermedia secretes only one hormone called melanocyte stimulating hormone (MSH).

(NEW NCERT 11th Page No. 241)

171. (3)

Surgical methods, also called sterilisation, are generally advised for the male/female partner as a terminal method to prevent any more pregnancies. Surgical intervention blocks gamete transport and thereby prevent conception. Sterilisation procedure in the female is called 'tubectomy'. In tubectomy, a small part of the fallopian tube is removed or tied up through a small incision in the abdomen or through vagina.

(NEW NCERT 12th Page No. 45, 46)

172. (3)

Nearly 20-25 per cent of CO_2 is transported by RBCs whereas 70 per cent of it is carried as bicarbonate. About 7 per cent of CO_2 is carried in a dissolved state through plasma. Eosinophils constitute 2-3% of total WBC.

(NEW NCERT 11th Page No. 188, 189, 194)

173. (1)

Fish with stout and strong fins could move on land and go back to water. This was about 350 mya. Jawless fish probably evolved around 350 mya. Sea weeds and few plants existed probably around 320 mya. By the time of 500 mya, invertebrates were formed and active.

(NEW NCERT 12th Page No. 122, 124)

174. (4)

In the centre of each 'I' band is an elastic fibre called 'Z' line which bisects it. The Z-line defines the boundary of the sarcomere in striated muscle and bisects the I-band of neighbouring sarcomeres.

(NEW NCERT 11th Page No. 220)

175. (2)

Agrobacterium tumifaciens, a pathogenic bacteria of several dicot plants is able to deliver a piece of DNA known as 'T-DNA' to transform normal plant cells into a tumor and direct these tumor cells to produce the chemicals required by the pathogen. It is a natural genetic engineer.

(NEW NCERT 12th Page No. 170)

176. (1)

List-I	List-II
Haemophilus influenzae	Pneumonia
Rhino virus	Common cold
Wuchereria malayi	Elephantiasis
Plasmodium falciparum	Malignant malaria

(NEW NCERT 12th Page No. 131, 133)

177. (4)

During a cardiac cycle, each ventricle pumps out approximately 70 mL of blood which is called the stroke volume. The stroke volume multiplied by the heart rate (no. of beats per min.) gives the cardiac output.

(NEW NCERT 11th Page No. 200)

178. (2)

On an average, females cockroach produce 9-10 oothecae, each containing 14-16 eggs.

(Old NCERT 11th Page No. 115)

179. (2)

Virus-infected cells secrete proteins called interferons which protect non-infected cells from further viral infection. This is an example of cytokine barrier.

(NEW NCERT 12th Page No. 135)

180. (2)

In order to force bacteria to take up the plasmid, the bacterial cells must first be made 'competent' to take up DNA. This is done by treating them with a specific concentration of a divalent cation, such as calcium, which increases the efficiency with which DNA enters the bacterium through pores in its cell wall.

(NEW NCERT 12th Page No. 170)

181. (4)

Pons consists of fibre tracts that interconnect different regions of the brain. A canal called the cerebral aqueduct passess through the midbrain. The dorsal portion of the midbrain consists mainly of four round swellings (lobes) called corpora quadrigemina. The inner parts of cerebral hemispheres and a group of associated deep structures like amygdala, hippocampus, etc., form a complex structure called the limbic lobe or limbic system.

(NEW NCERT 11th Page No. 236)

182. (1)

Drugs like barbiturates, amphetamines, benzodiazepines, and other similar drugs, that are normally used as medicines to help patients cope with mental illnesses like depression and insomnia, are often abused. Cocaine, commonly called coke or crack is usually snorted. It has a potent stimulating action on central nervous system, producing a sense of euphoria and increased energy.

(NEW NCERT 12th Page No. 143)

183. (2)

Bony fishes are ammonotelic. Kidney does not play any role in removal of ammonia. *Clarias* is an example of bony fish. *Canis*, *Felis* and *Delphinus* are mammals which are ureotelic.

(NEW NCERT 11th Page No. 48, 51, 205)

184. (1)

Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles. It is not a bacterial infection.

(NEW NCERT 11th Page No. 190)

185. (2)

Embryological support for evolution was proposed by Ernst Heckel based upon the observation of certain features during embryonic stages common to all vertebrates that are absent in adult.

(NEW NCERT 12th Page No. 113)

SECTION-B

186. (3)

Salmonella typhi is a pathogenic bacterium which causes typhoid fever in human beings. *Streptococcus pneumoniae* and *Haemophilus influenzae* are responsible for the disease pneumonia in humans which infects the alveoli (air filled sacs) of the lungs.

(NEW NCERT 12th Page No. 130, 131)

187. (4)

List-I	List-II
Gametogenesis	Formation of sperms and ova
Insemination	Release of sperm into female genital tract
Ejaculation	Release of sperms out of the male body
Implantation	Attachment of blastocyst to uterine wall

(NEW NCERT 12th Page No. 31, 32, 37)

188. (3)

In frog, a triangular structure called sinus venosus joins the right atrium. The ventricle opens into a sac- like conus arteriosus on the ventral side of the heart.

(NEW NCERT 11th Page No. 82)

189. (1)

Due to the continental drift pouched mammals of Australia survived because of lack of competition from any other mammal.

(NEW NCERT 12th Page No. 124)

190. (2)

Hypertension is the term for blood pressure that is higher than normal (120/80). In this measurement 120 mm Hg (millimetres of mercury pressure) is the systolic, or pumping, pressure and 80 mm Hg is the diastolic, or resting, pressure. If repeated checks of blood pressure of an individual is 140/90 (140 over 90) or higher, it shows hypertension.

(NEW NCERT 11th Page No. 202, 203)

191. (3)

In human beings, after one month of pregnancy, the embryo's heart is formed. The first sign of growing foetus may be noticed by listening to the heart sound carefully through the stethoscope. By the end of the second month of pregnancy, the foetus develops limbs and digits. The first movements of the foetus and appearance of hair on the head are usually observed during the fifth month.

(NEW NCERT 12th Page No. 38)

192. (3)

Sycon belongs to phylum Porifera and is asymmetrical, Blue whale and Penguin belongs to phylum chordata and are bilaterally symmetrical. All perform internal fertilisation. Blue whale and Penguin are homoiothermous.

(NEW NCERT 11th Page No. 40, 51)

193. (4)

If an alien DNA is inserted at Pst I site of cloning vector pBR322 then the recombinants are sensitive to ampicillin because of insertional inactivation of ampicillin resistant gene. Some of the restriction enzymes cut the strand of DNA a little away from the centre of the palindrome sites, but between the same two bases on the opposite strands.

(NEW NCERT 12th Page No. 167, 169)

194. (2)

The epithelial cells of Bowman's capsule called podocytes are arranged in an intricate manner so as to leave some minute spaces called filtration slits or slit pores.

(NEW NCERT 11th Page No. 208)

195. (3)

We have two lungs which are covered by a double layered pleura, with pleural fluid between them. It reduces friction on the lung-surface.

(NEW NCERT 11th Page No. 184)

196. (2)

List-I	List-II
Estradiol	Steroid
Thyroxine	Iodothyronine
Epinephrine	Amino-acid derivative
Glucagon	Protein

(NEW NCERT 11th Page No. 248)

197. (3)

Ball and socket joint (between humerus and pectoral girdle), hinge joint (knee joint), pivot joint (between atlas and axis), gliding joint (between the carpals) and saddle joint (between carpal and metacarpal of thumb) are some examples of synovial joint.

(NEW NCERT 11th Page No. 227)

198. (1)

The neural system of all animals is composed of highly specialised cells called neurons which can detect, receive and transmit different kinds of stimuli.

(NEW NCERT 11th Page No. 231)

199. (4)

The method of producing thousands of plants through tissue culture is called micro-propagation. This capacity to generate a whole plant from any cell/explant is called totipotency. The nutrient medium used in tissue culture must provide a carbon source such as sucrose and also inorganic salts, vitamins, amino acids and growth regulators like auxins, cytokinins etc.

(NEW NCERT 12th Page No. 178)

200. (3)

A survey of animal kingdom presents a variety of excretory structures. Protonephridia, nephridia, malpighian tubules, green glands and the kidneys are the common excretory organs in animals. They not only eliminate nitrogenous wastes but also help in the maintenance of ionic and acid-base balance of body fluids.

(NEW NCERT 11th Page No. 206, 214)

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